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71 Applicant: ITALGEL S.P.A.
Via Tanara, 20/a
Parma(IT)

72 Inventor: Moro, Vincenzo, Dr.
Villaggio La Pinetina
Appiano Gentile (Como)(IT)

74 Representative: Bonfreschi, Mario
Bugnion S.p.A. Viale Trento Trieste, 25
I-41100 Modena(IT)

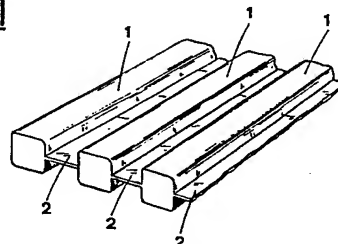
54 Improved container for freezable liquids, used in particular for extracting heat from small enclosures.

57 The invention relates to an improved container for freezable liquids, used in particular for extracting heat from small enclosures.

This container is substantially composed of more than one hollow element, which may have a parallelepiped, spherical, or any other geometrical shape, that contain the freezable liquid; these hollow elements are connected to each other by non-rigid connection elements so that, even when the liquid is frozen, relative movement between the various hollow elements is possible.

The container may be included in ice-boxes or similar constructions, or may be itself adapted to define an internal space into which the products to be refrigerated can be inserted.

FIG1



- 1 -

Improved container for freezeable liquids, used in particular for extracting heat from small enclosures

The present invention concerns an improved container for freezeable liquids, used in particular for extracting heat from small enclosures.

5 Such containers, which are normally sealed and have a parallelepiped shape, are placed in refrigeration cells until the liquid contained in them freezes. When the freezing process is complete, these are then placed into small thermically insulated enclosures,
10 for example ice-boxes, or bags with insulated casings, containing products to be maintained at a low temperature. The liquid contained in the containers melts, extracting heat from the said enclosure, thus keeping the internal temperature low.

15 Substantially, such containers perform the same function of "cold accumulation" that in the old ice-boxes was performed by the ice itself. They present, however, a considerable advantage: the melted liquid does not
20 spread throughout the ice-box, but remains closed within the containers.

Such containers present the problem that their placement within the refrigeration areas, that as noted above contain other products, is often difficult because their
25 rigid form is not easily adapted for placement among the products.

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Besides this, more than one container is necessary to refrigerate the products on their various sides.

One of the objects of the present invention is to eliminate the problems mentioned above, by providing
5 an improved container that can be easily included among the products to be refrigerated, and that allows the various sides of the products themselves to be refrigerated.

- 10 A further object of the present invention is to provide a easily and economically constructed container.

A further object of the present invention is to provide a container, the use of which does not necessarily
15 require being combined with special thermically insulated casings, such as ice-boxes, bags with insulated casings, etc.

These and other objects too are provided by the invention
20 tion herein described, essential features of which are that it comprises: more than one hollow element, containing the liquid; the cavities not being inter-communicating, since they are connected to each other by non-rigid connection elements.

25 Further characteristics and advantages of the invention will emerge more obviously from the detailed description that follows of one preferred but not sole form of embodiment for the container in question; illustrated
30 purely as an unlimited example on the accompanying drawings, in which:

The container illustrated in Figure 1 comprises more than one hollow element (1), with a nearly parallele-

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piped shape, each one containing liquid to be frozen. The elements (1) are sealed, and their cavities are not inter-communicating ; the elements being connected to each other by means of zipper-type connection elements,
5 formed of flat strips of flexible material. Normally, such containers are constructed in moulded (or otherwise formed) plastic material, so that the strips (2) are made of the same material as the sides of the hollow elements (1).

10

The hollow elements (1) can have a cylindrical shape (Figure 2), a spherical shape (Figure 3), or any other geometrical shape.

15 In the example of Figure 1), the connection elements are arranged to permit the rotation of one hollow element (1) with respect to the other elements (1) around parallel axes, to the degree that the strips (2) are parallel. However, if the hollow elements (1) have a
20 shape other than parallelepiped, for example if they have the shape of a prism with trapezoidal base connected on their slanted sides, the strips (2) would not be parallel, and the rotation around the axes would be in the direction of the strips themselves.

25

In the example of Figure 2), the connection elements are arranged to permit the rotation of one hollow element (1) with respect to the other elements (1), around axes perpendicular to each other; this arrangement
30 also permits the various hollow elements to be slightly twisted.

In the example illustrated in Figure 3), the connection elements are formed of bars (3), composed of flexible

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material, at the ends of which are connected the hollow elements, so as to form a "chain" of hollow elements. With such an arrangement, the rotation of one hollow element with respect to the others can take place around any axes. When, after having left these containers in a freezer for the necessary amount of time, the containers will be used to refrigerate an ice-box, for example, or to maintain products refrigerated during their transport in ice-bags, etc., their elements are rigid, so that the liquid they contain is solidified, even though the material they are composed of is flexible. The elements that connect the hollow elements do permit, however, the hollow elements themselves to rotate among themselves, allowing for the most convenient arrangement of the containers within the ice-box. For example, they can be wrapped around the products that must be kept cold, and can be inserted into the spaces between the products themselves.

The quantity of liquid contained in the container can be much greater than that contained in normal containers, so that their "refrigerating effect" is increased, to the extent that it is possible to provide a considerable number of hollow elements for each container, given that the placement within the enclosure to be refrigerated can be arranged to fill up the empty spaces between one product and another, as described above.

It is also possible to construct the containers in question so that all the half-shells of the hollow elements (1) found on the same side with respect to a median plane of the container are constructed or covered with a material having a low coefficient of heat

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transmission, that is to say a thermically insulated material. In this way, if we consider rotating, for example, the hollow elements of the container as in Figure 1), in such a way to form a closed surface, the external part being made up of the half-shells covered with insulation material, a space is created inside of the closed surface which undergoes the refrigerating effect of the container, this space being thermically insulated by the material that makes up the external zone of the container. Curved in this way, the container can be inserted into any other container, for example a plastic bag, or a bag of any other type, permitting a sufficient refrigerating effect on the products contained within it. This occurs if the bottom parts of the spaces thus obtained are not thermically insulated, since the lateral parts of the said space, which have a considerably larger surface area than the bottom part, are insulated and thus heat absorption is sharply limited. Even the containers which are not externally covered with insulation material can be curved and inserted into other containers, such as the above-mentioned plastic bags or bags of any other type, even if in this case the refrigerating effect has a shorter duration. The containers in question can themselves make up the sides of a casing into which the products to be refrigerated may be inserted; these can be molded into a sack-like shape, with handles attached to facilitate gripping. When not used to contain products, these containers can be curved in various ways in order to occupy a very limited space, since there exists a considerable possibility of movement between one element and the next.

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Thanks to its special construction the container herein described can be used for therapeutic purposes, for example in place of a normal ice-pack, in contrast to which the invention herein described carries the
5 advantage of being more easily wrapped around that part of the anatomy to be cooled.

It is likewise evident that, in addition to cooling the liquid within the container it is possible to heat this
10 same liquid, thus making use of the container as an accumulator of heat.

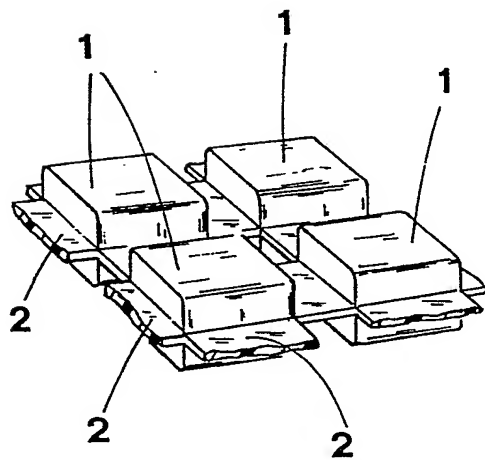
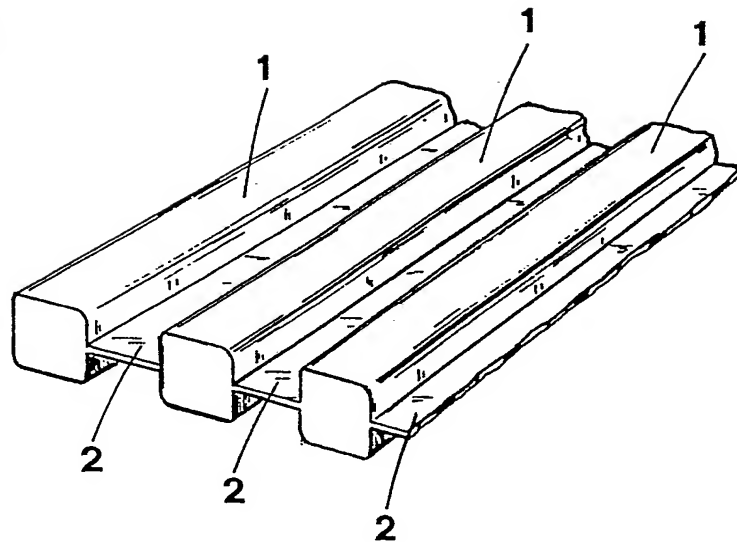
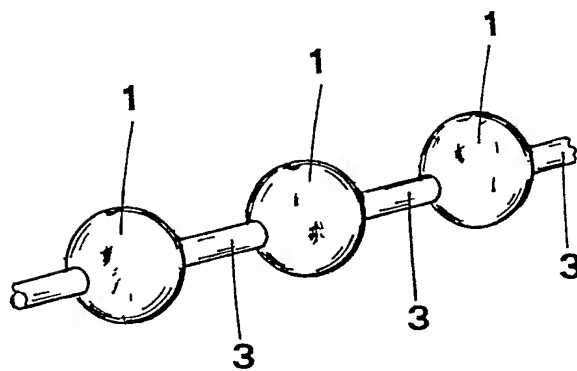
Numerous modifications of a practical nature can be applied to the constructive details of the invention;
15 for example, the various types of illustrated connection elements and hollow elements can be arranged in various ways, or connection elements of a different type as well as hollow elements of a different shape can be used, without deviating from the framework of protection
20 afforded to the conceptual ideas behind the invention, as claimed on the following page.

25

30

Claims

- 1) Improved container for freezeable liquids, used in particular for extracting heat from small enclosures, essential features of which are that it comprises:
5 more than one hollow element (1), which serve to contain the liquid, the cavities of which are not inter-communicating, said hollow elements being connected by non-rigid connection elements.
10
- 2) Container according to the preceeding Claim, essential features of which are that the said connection elements are formed of zipper-type elements.
- 15 3) Container according to Claim 1), essential features of which are that the said connection elements are formed by strips of flexible material (2), which are connected at their edges to the said hollow elements.
- 20 4) Container according to Claim 1), essential features of which are that the said connection elements are formed by bars of flexible material (3), which are connected at their extremities to the said hollow elements.
- 25 5) Container according to Claim 1), essential features of which are that the half-shells of the said hollow elements which are found on the same side with respect to a median plane of the container, are constructed or
30 covered with material having a low coefficient of heat transmission.
- 6) Container according to Claim 1), essential features of which are that the said hollow elements (1) are
35 connected to each other, and arranged in such a way to define a contained space which serves to contain the products to be refrigerated.

FIG1FIG2FIG3